



INDIAN SCHOOL DARSAIT

DEPARTMENT OF MATHEMATICS



Subject : Mathematics Topic : 3D Date of Worksheet :30/04/2018

Resource Person: Premela Isac Date of submission:06/05/2018

Name of the Student : _____ Class & Division : XI Roll Number : ____

S.No.	Questions	Marks
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Section A (Basics):

1. Distance Formula: $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$
2. Section Formula: i) $(\frac{m x_2 + n x_1}{m+n}, \frac{m y_2 + n y_1}{m+n}, \frac{m z_2 + n z_1}{m+n})$ [internally]
ii) $(\frac{m x_2 - n x_1}{m-n}, \frac{m y_2 - n y_1}{m-n}, \frac{m z_2 - n z_1}{m-n})$ [externally]
3. Mid – Point Formula : $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}, \frac{z_1+z_2}{2})$
4. Centroid : $(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}, \frac{z_1+z_2+z_3}{3})$

Section B :

1. Show that the points (a, b, c), (b, c, a) and (c, a, b) are the vertices of an equilateral triangle. 4
2. Find the locus of P if $PA^2+PB^2 = 2k^2$, where A and B are the points (3 , 4 , 5) and (-1 , 3 , 7) 4
3. Determine the point on XY-plane which is equidistant from three points A(2,0,3), B(0,3,2) and C(0,0,1). 4
4. Find the co-ordinates of the point which is three fifth of the way from (3,4,5) to (-2,-5,-7). 4
5. Centroid of a triangle with vertices (a, 1, 3), (-2,b,-5) and (4, 7, c) is origin. Find the values of a, b and c. 4
6. The midpoints of the sides of a triangle are (1, 5, -1), (0, 4, -2) and (2, 3, 4). Find the co-ordinates of the vertices of the triangle. 4
7. Find the ratio in which the join of A (2, 1, 5) and B (3, 4, 3) is divided by the plane $2x + 3y - 2z = 1$. Also find the coordinates of the point of division. 4

Section C (Hots):

1. Show that the plane $ax + by + cz + d = 0$ divides the line joining the points (x_1, y_1, z_1) and (x_2, y_2, z_2) in the ratio $-\frac{ax_1 + by_1 + cz_1 + d}{ax_2 + by_2 + cz_2 + d}$. 6
2. Find the ratio in which the sphere $x^2 + y^2 + z^2 = 504$ divides the line joining the points (12 , - 4 , 8) and (27 , - 9 , 18). 6